

NOTE ON THE DUCT OF THE SPERMATHECA OF *HYALINIA EXCAVATA*.

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## PLATE X.

THE curious anatomy of the duct of the spermatheca in *Hy. excavata* and *nitida* was noticed by C. Ashford, and first, I think, described by W. Moss.<sup>1</sup> They found that passing downwards from the spermatheca the duct bifurcated, one branch opening into the vagina in the usual way, while the other came into relation with the penis and possibly opened into it. P. Pelseneer<sup>2</sup> found that this second branch did not actually form a passage into the lumen of the penis, but ended in a blind sac surrounding the lower end of the penis and dart-sac.<sup>3</sup>

So anomalous an arrangement seemed worth reinvestigation, and I have examined in detail, by means of complete series of microscopical sections, five specimens out of a number collected at Portmadoc (Carnarvonshire) in August, 1913. As appears to be usual at that time of year, few of them had darts; of the specimens examined two possessed spicula, and in the other three the dart-sac was empty.

The accompanying sketches of nine sections, approximately transverse to the general axis of the genital apparatus, show the condition found. The sections were each 0·009 mm. thick, and the numbers attached to each show its position in relation to the section containing the external genital orifice, which would be numbered 0. Section 133 shows the oviduct with the vas deferens and spermatheca duct. In section 129 the latter has divided into three branches, one of which (duct A) almost immediately opens into the oviduct, the transition being shown in section 124. The other two (ducts B and C) run for a short distance in close connexion with the wall of the oviduct, but presently separate from it, and from one another, as seen in section 107, which shows also the passage of the vas deferens into the penis, and the upper end of the dart-sac. Section 97 shows penis, dart-sac, free oviduct, duct B close to the dart-sac, duct C in contact with the oviduct, and also the upper extremities of the sac (S) into which duct B opens. This opening is placed just below section 94. In section 90, penis, dart-sac and oviduct are confluent, duct B has disappeared into the sac which is about here at its largest, and duct C is still separate. The opening of duct C into the vagina concurrently with the junction of the penis and dart-sac is shown in section 85, while section 77 shows the common genital passage and the lower extremity of the sac.

<sup>1</sup> *Journal of Conchology*, vol. viii, pp. 421, 1897.

<sup>2</sup> *Mém. Acad. roy. Belgique*, vol. liv, p. 62 (of reprint), 1901.

<sup>3</sup> See the description and figures of J. W. Taylor, *Monograph*, vol. iii, pp. 135, 142.

Duct C, running from the spermatheca to the genital passage in the neighbourhood of the origin of the penis, is evidently the customary duct. Duct A, much smaller than the other two, affords an alternative route to the oviduct: it has not, I believe, been previously described and, while it was quite obvious in the three smaller specimens which I examined, it could not be found in the two larger ones which had darts. Possibly therefore it represents some arrangement which is falling into desuetude. Duct B, which for most of its course is the largest of the three branches, is the most curious, since it opens below into a thin-walled sac lying round the upper end of the common genital passage and the lower parts of the penis and dart-sac. I could find no opening out of this sac save into duct B; indeed, I am fairly confident that no other anatomical opening exists. The sac is lined with simple thin epithelium, as is also duct B in its lower two-thirds, and in none of the specimens did the sac show any visible contents. The appearances do not, therefore, suggest that the sac has any very active secretory function, but rather that it is a reservoir of liquid. In the face of our ignorance of the function of the spermatheca, speculation is hardly proper, but it may perhaps be suggested that when the penis is everted in copulation the sac would probably be compressed and any liquid in it forced along duct B: in this way duct C, and possibly the spermatheca itself, would be washed out into the vagina. Alternatively the sac might act as an aspiratory apparatus on the cessation of copulation, though the tenuity of its walls renders this unlikely. The examination of sexually active specimens might throw much light on the matter, but these I have not been fortunate enough to meet with.

The specimen from which the drawings were made had a shell 6.4 mm. in diameter: the body was straightened out and probably somewhat stretched before the sections were prepared.

A, duct A of spermatheca; B, duct B of spermatheca; C, duct C of spermatheca; *a.* common genital passage; *S.* sac into which duct B opens; *ov.* oviduct; *p.* penis; *d.* dart-sac; *v.d.* vas deferens; *d.sp.* undivided duct of spermatheca.

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